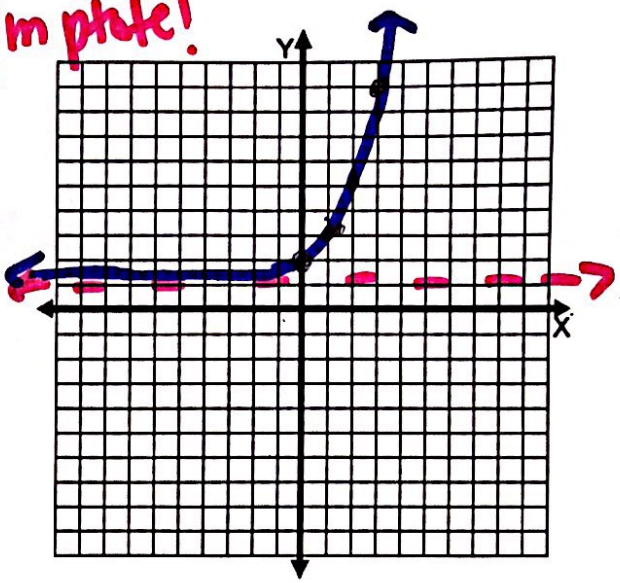
GUIDED NOTES: Graphs of Logarithmic and Exponential Functions

EX1. Graph $f(x) = 2^x + 1$ ← tells me my asymptote!



Interval Notation: (low bound, high bound)

domain: (x values) $(-\infty, \infty)$

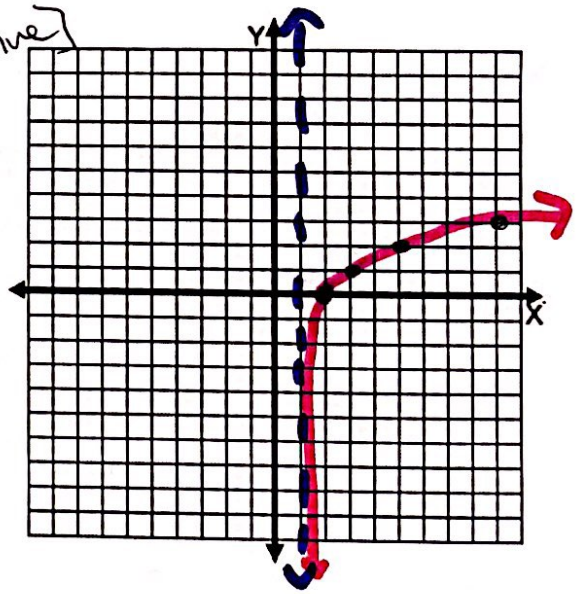
range: (y values) $(1, \infty)$

horizontal asymptote: $y = 1$

end behavior: As $x \to \infty$, $y \to \infty$

Asymptote: A line that we approach but never cross
"I'm not touching you" (Invisible Fence)

EX2. Graph $f(x) = \log_2(x-1)$ Asymptote in parentheses with x. [Set = 0 & solve]



Calculator:

log(Big font)

log(small font)

domain: $(1, \infty)$

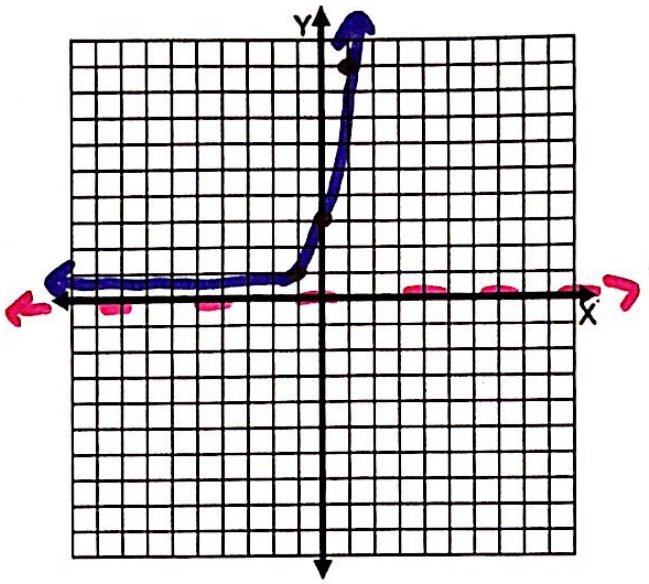
range: $(-\infty, \infty)$

vertical asymptote: $x = 1$

end behavior:

As $x \to \infty$, $y \to \infty$

EX3. Graph $f(x) = 3^{x+1}$ $+0$ ← "Asymptote invisible" not included



domain: $(-\infty, \infty)$

range: $(0, \infty)$

horizontal asymptote: $y = 0$

end behavior:

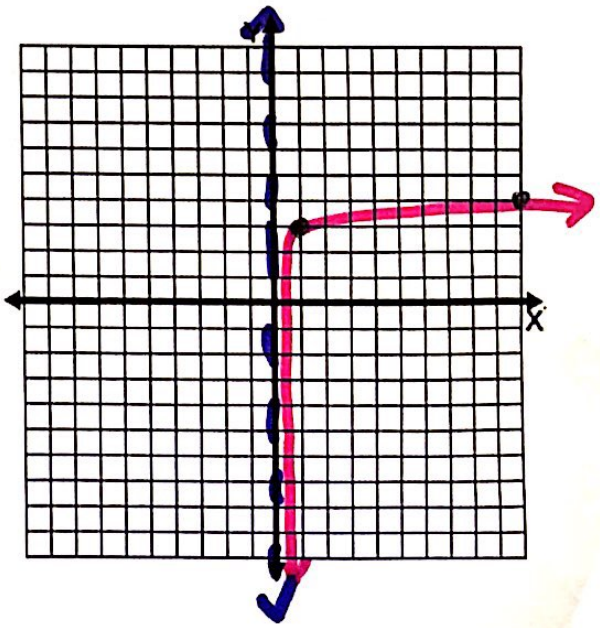
As $x \to \infty$

$y \to \infty$

$(x + 0)$

↓

EX4. Graph: $f(x) = \log x + 3$



domain: $(0, \infty)$

range: $(-\infty, \infty)$

vertical asymptote: $x = 0$

end behavior:

As $x \to \infty$

$y \to \infty$